Title: Fraction Story

Brief Overview:

> Students will be introduced to fractions as they analyze, manipulate, and create fractions using a variety of shapes. In addition, students will create a short story about fractions as a performance-based assessment.

NCTM 2000 Principles for School Mathematics:

- **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*

- **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*

- **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*

- **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*

- **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*

- **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

Links to NCTM 2000 Standards:

- **Content Standards**

  Number and Operations
  Students will understand fractions, and ways of representing fractions; understand the meaning of fractions and how they relate to a whole; and use computational tools and strategies fluently when comparing fractions.

  Geometry
  Students will use visualization and spatial reasoning to solve fractional problems.

- **Process Standards**

  Problem Solving
  Students will apply a variety of strategies to solve problems involving fractions and dividing whole units into equal parts.

Reasoning and Proof

Students will demonstrate their ability to reason mathematically by determining what fraction would be the largest, and they will be responsible for proving their answers.

Communication

Students will demonstrate their ability to communicate using fractional terms. They will communicate the fractions orally, written numerically, and by shape.

Connections

Students will use mathematical strategies to solve real-life problems. They will connect the use of fractions into situations that have occurred in their life.

Representation

Students will create and use a variety of ways to represent fractions (numerically, orally, and by shapes).

Grade/Level:

Grades 3-5 (Special Education)

Duration/Length:

Three days, 40 minute lessons

Prerequisite Knowledge

Students should have working knowledge of the following skills:

- Integers
- Writing complete sentences
- Sequencing (fractions and story chain)

Student Outcomes:

Students will:

- identify fractions as parts of a whole.
- recognize, name, and associate shapes to fractions.
- draw pictorial representations of the fractions.
- write a short story incorporating fractions.

Materials/Resources/Printed Materials:

- Gator Pie by Louise Mathews
- Teacher Resource Sheets #1-6
- Student Resource Sheets #1-7
- Poster board

- Glue
- Markers
- Construction paper
- 5" colored plastic plates (2 plates of different colors for each student)
- Pattern blocks
- Overhead pattern blocks
- Fraction Island set
- 11 point Geo-board
- Overhead Fraction Island set

Development/Procedures:

Day 1
- Present the following situation to your class:

  In the next three days you are going to have a very important job. A group of students in our school are depending on you! You will be learning a great deal of information on fractions. Using this information your job will be to create a storybook that shows a variety of fractions. These books will be given to second-graders so it will be easier for them to learn fractions.

- Create a K-W-L chart to determine the classes previous knowledge of fractions. (See **Teacher Resource Sheet 1**.)
- Introduce the book Gator Pie by Louise Mathews. Ask the class to predict how fractions will be involved in the story by only looking at the cover of the book. Write predictions on the chalkboard.
- Read Gator Pie.
- Go to chalkboard and check the student's predictions about the story.
- Ask students why the characters in the story got angry when more alligators came to get pie.
- Using plate manipulatives, (See **Teacher Resource Sheet 2**.) have students estimate the different sizes of pie as divided in the story. {i.e., When you are reviewing the book and get to the page that shows three gators, have the class move their plates to show how much of the pie each would get (1/3).}
- Have students complete **Student Resource Sheets 1 and 2**. Collect when finished.

Day 2
- Have students recall the different fractions that were used in the book. This can be done by using the fraction plates as used in Day 1.
- Distribute **Student Resource Sheets 3 and 4**.
- Review the fractions from the previous lesson using pattern blocks. The students will have pattern blocks for their desk and the teacher will have a set for the transparency. Use **Student Resource Sheets 3 and 4** to make the transparency.
- Work through **Student Resource Sheets 3 and 4** with students while discussing the different parts of a whole.

- Introduce students to "Making Pie" game and have them play the game in groups of 3-4. (See **Teacher Resource Sheet 3**.) Gameboard and die can be made from **Student Resource Sheets 5 and 6**.
- Have students create a fraction bulletin board. Divide the class into groups of two or three. Assign each group a fraction set (1/2, 1/3, etc.) Have each group find circular and rectangular objects in the classroom of a variety of sizes. Trace the objects onto construction paper and divide into the assigned fractions. Glue the fraction onto the poster board. Make sure the poster has a title that names the fraction set.
- Complete **Student Resource Sheet 7**. Collect when finished.

Day 3
- Review **Student Resource Sheet 7**.
- Divide class into groups of two or three students.
- Review fractions with the *Fraction Island* set. (See **Teacher Resource Sheet 4**.)
- Brain storm ideas that could be used for storybook if time allows.

Performance Assessment:

Each student will develop a fraction storybook. The expectations of the storybook are provided on **Teacher Resource Sheet 5**. The storybooks will be presented to a second-grade class and be used as an evaluation tool for the teacher. The rubric for scoring is included as **Teacher Resource Sheet 6**.

Extension/Follow Up:

Students could make a comparison book that compares fractions. Adding and subtracting fractions could also be included when comparing the fractions. An additional activity would be to bake a pie and having the class divide the pie so each student receives an equal part. Show the class that fractions are also used when measuring the ingredients in the pie.

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FRACTIONS
(K-W-L Chart)

WHAT I KNOW	WHAT I WANT TO KNOW	WHAT I HAVE LEARNED

Directions to make a fraction plate manipulative.

1. You will need two different colors of 5-inch light plastic plates. You can find these in a grocery store in the paper plate section.

2. Make a cut on each of the plates to the center.

3. Slide the two plates together using the two cuts.

4. You now can rotate the plates to illustrate different fractions.
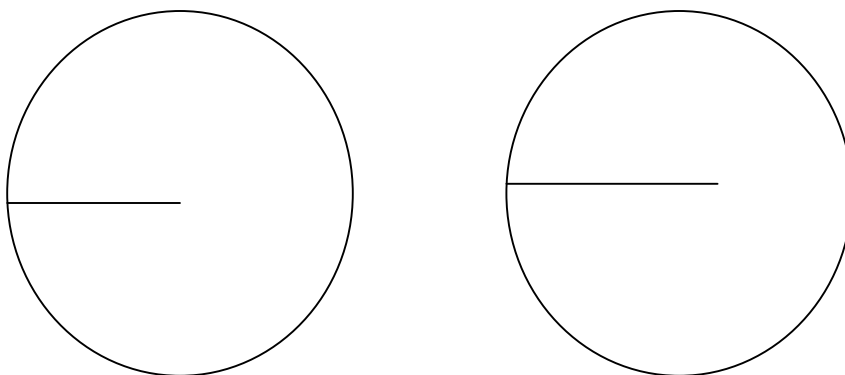
Making Pie

The object of this game is to get students to recognize basic fractions and the parts that make-up the whole.

1. Introduce the game to the students by telling them that they are going to be making a pie using fractions.

2. Divide the class into groups of three to four students.

3. Each student will get a game board (Student Resource Sheet 6) and each group will get one die (Student Resource Sheet 5).

4. Students take turns rolling the dice and placing the appropriate pattern blocks on their game boards.

5. The first student to complete their game board wins the game!

Fraction Island

1. Sort through the Fraction Island pieces and only use the rectangle parts for this introductory exercise.

2. Give each group or individual a geo-board and a set of the presorted parts. Depending on the level of the group, you may want to already have the rubber band on the board.

3. Using a 3 x 4 area, have the students fill the area with the least number of single color pieces. Then have them take one out. (The teacher should model this on the overhead.) Ask the students to name the fractional part that was taken away.

4. Continue this with different size rectangular parts to represent thirds, fourths, and sixths.

5. Depending on the group, you may want to move to different size areas and more fractional parts.

<u>Storybook Requirements</u>

The students should:

- include the fractions 1/2, 1/4, 1/3, 1/6, and a whole item in their story.

- include a pictorial representation of each fraction in their story. (i.e., ▫would represent 1/4)

- include a numerical representation of each fraction in their story. (i.e., 1/4)

- use sequential order so the fractions in the story go from either smaller parts to a whole or a whole to smaller parts.

- is at least five pages in length.

- includes complete sentences, proper spelling, and proper grammar.

<u>RUBRIC FOR STORYBOOK</u>

	Includes fractions 1/2, 1/4, 1/3, 1/6, and a whole item	*Pictorial Representation*	*Numerical Representation*	*Sequential Order*	*Length*	*Spelling, Complete Sentences, and Grammar*
4	Includes 4 Fractions	Picture of 4 Fractions	# Rep. of 4 Fractions	4 Fractions Are Sequenced	5 or more Pages	No Language Arts Errors
3	Includes 3 Fractions	Picture of 3 Fractions	# Rep. of 3 Fractions	3 Fractions Are Sequenced	4 Pages	1 or 2 Language Arts Errors
2	Includes 2 Fractions	Picture of 2 Fractions	# Rep. of 2 Fractions	2 Fractions Are Sequenced	2-3 Pages	3 or 4 Language Arts Errors
1	Includes 1 Fraction	Picture of 1 Fraction	# Rep. of 1 Fraction	Fractions are not Sequenced	1 Page	5 or more Language Arts Errors
0	NO EFFORT					
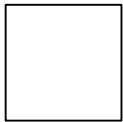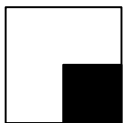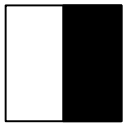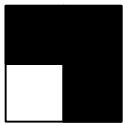
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Dividing the Pie

Divide the pies so that each alligator gets an equal piece.

A.
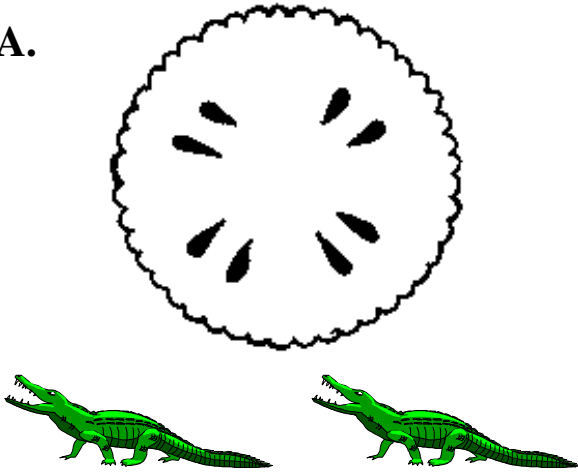
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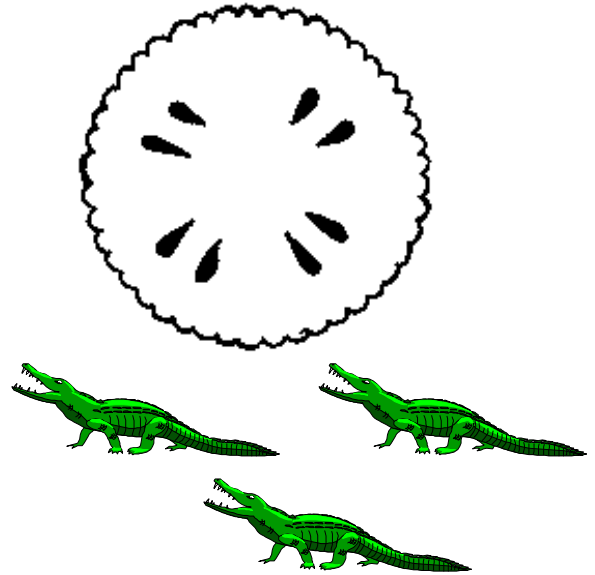
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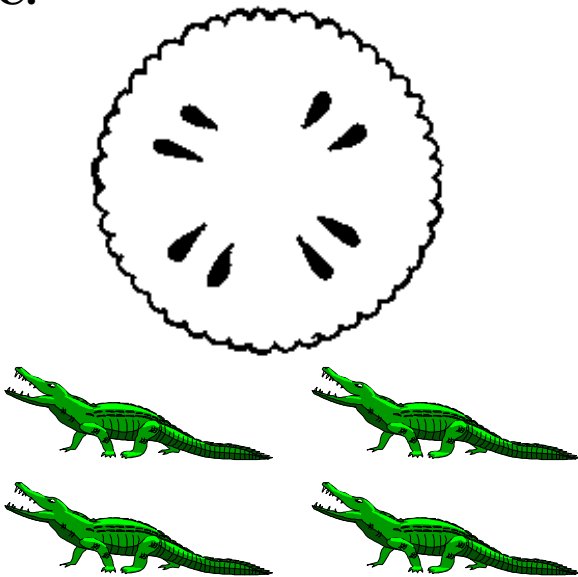
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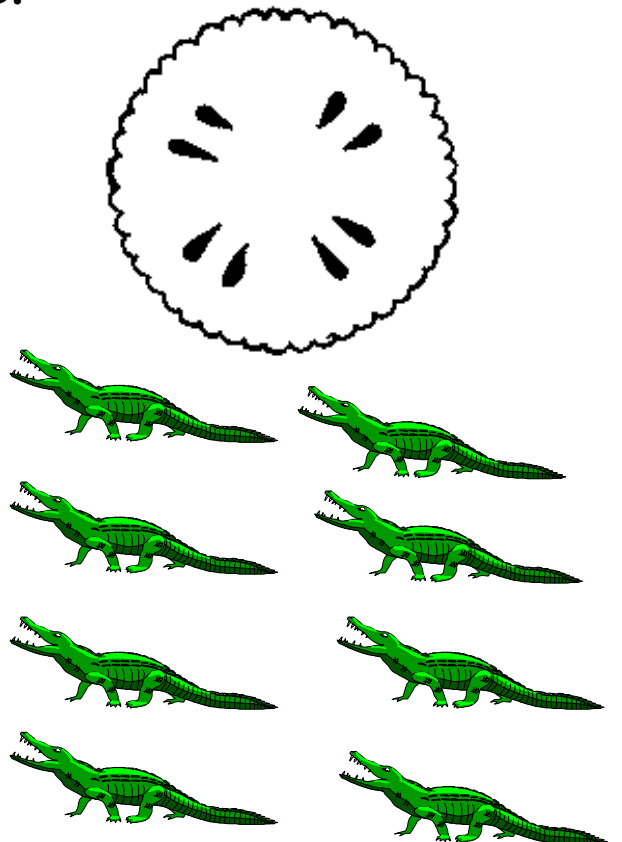
Write a complete sentence to answer the
following questions.

1. Which group will get the most pie? Give
    reasons for your choice.

    _____

    _____

    _____

    _____

2. Which group will get the least amount of
    pie? Give reasons for your choice.

    _____

    _____

    _____

    _____

Name: _____   Date: _____

Fractions

Fill the whole shape using
the red patterns blocks.

How many blocks did it
take to fill the whole? _____
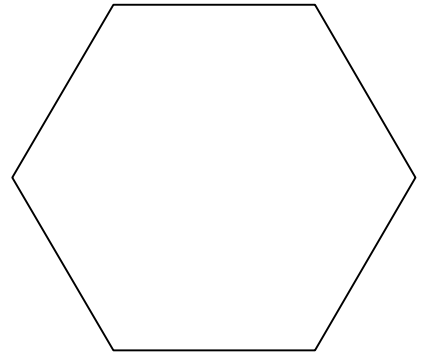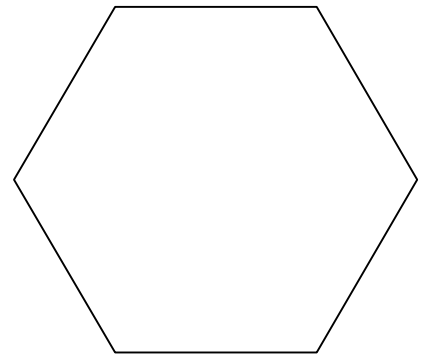
Take one piece away.

How many did you take?
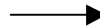
How many total pieces to fill the shape?
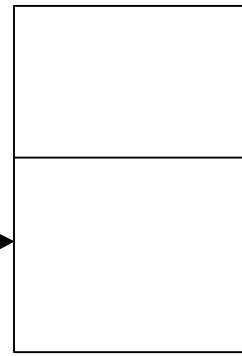
Fill the whole shape using
the blue pattern blocks.

How many blocks did it
take to fill the whole? _____
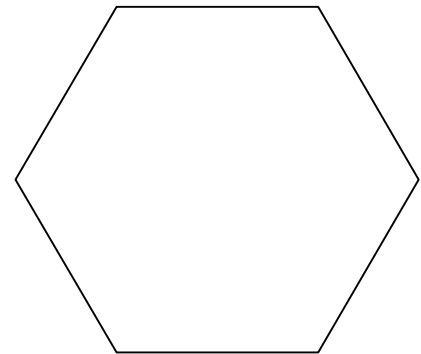
Take one piece away.

How many did you take?
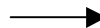
How many total pieces to fill the shape?
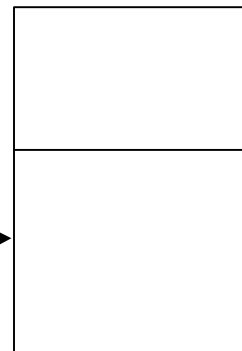
Fill the whole shape using
the brown pattern blocks.

How many blocks did it
take to fill the whole? _____
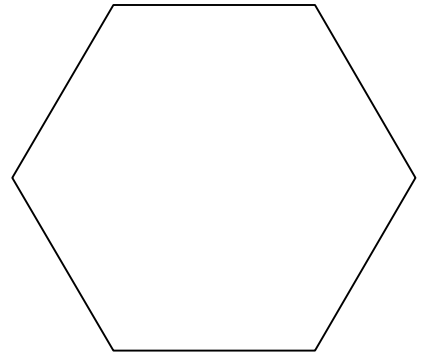
Take one piece away.

How many did you take?

How many total pieces to fill the shape?
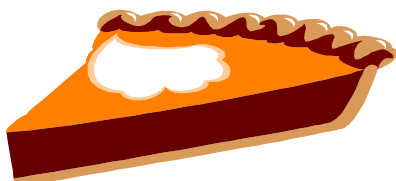
_____
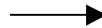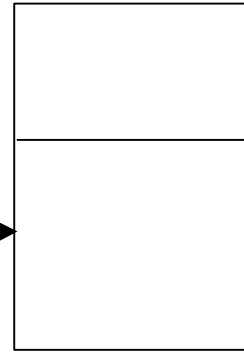
Fill the whole shape using
the green pattern blocks.

How many blocks did it
take to fill the whole? _____

Take one piece away.

How many did you take?
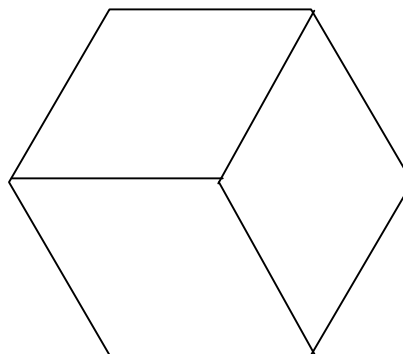
How many total pieces to fill the shape?
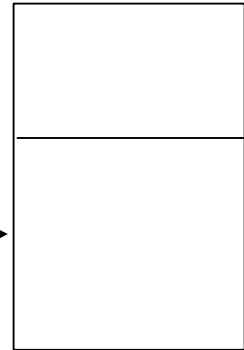
Dice Used for Pie Game

Cut the pattern below and tape it into a cube. Make enough for each group has one cube.

	$\frac{1}{2}$	
	$\frac{1}{4}$	
$\frac{1}{3}$	Free Piece Of Pie, Any Size	Lose Turn
	$\frac{1}{6}$	
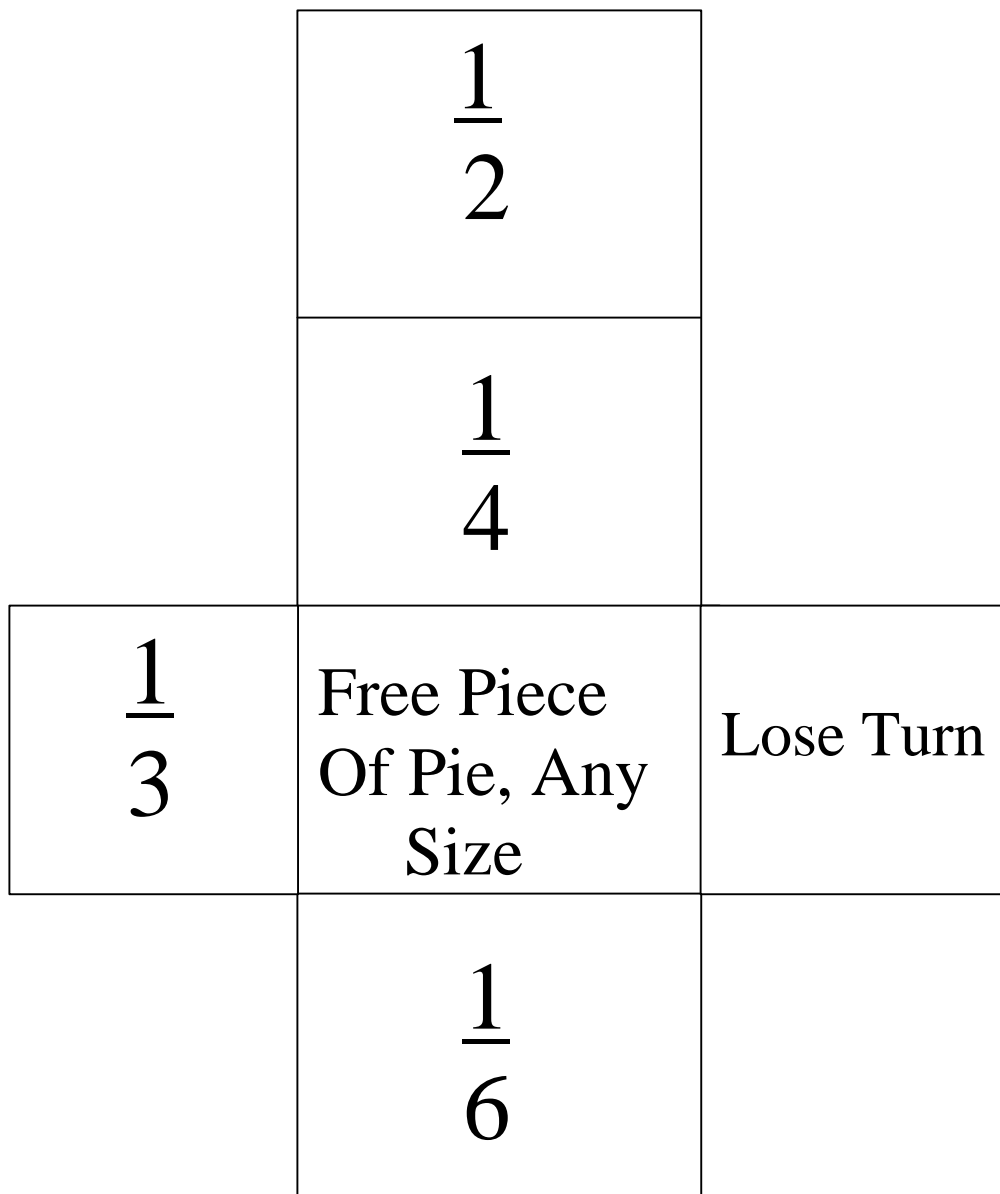
Making Pie
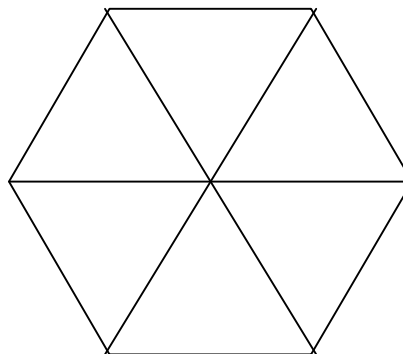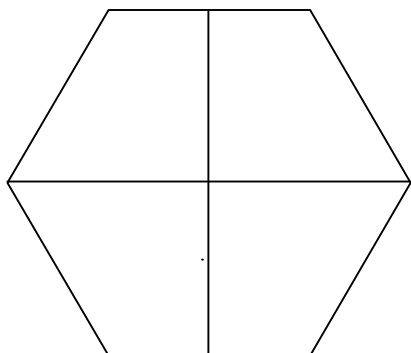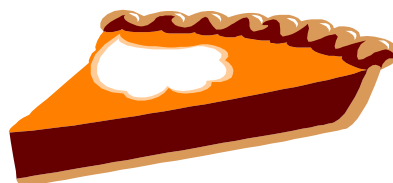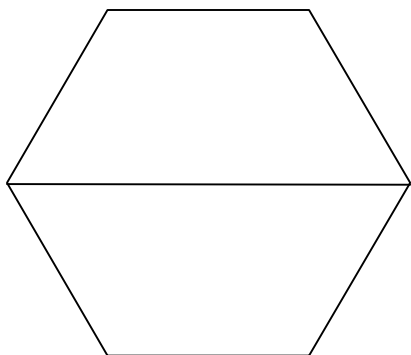
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Pencil Fractions

Draw a line to divide the pencil into two equal lengths.
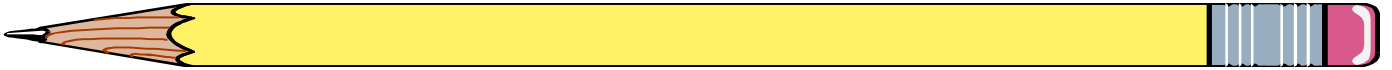Now shade one part of the pencil.
How much of the pencil is shaded? _____

Draw a line to divide the pencil into three equal lengths.
Now shade one part of the pencil.
How much of the pencil is shaded? _____

Draw a line to divide the pencil into four equal lengths.
Now shade one part of the pencil.
How much of the pencil is shaded? _____

Draw a line to divide the pencil into six equal lengths.
Now shade one part of the pencil.
How much of the pencil is shaded? _____